



SEQUENCE LISTING

<110> Heinrichs, Jon
Johnson, Leslie S.
Koenig, Scott
Adamou, John E.

<120> Pneumococcal Protein Homologs and Fragments for
Vaccines

<130> 469201-493

<140> U.S. 09/645,835

<141> 2000-08-25

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<170> PatentIn Ver. 2.1

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<212> DNA

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<213> Streptococcus pyogenes

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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
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Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
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Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
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 115 120 125

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Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile
 195 200 205

Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His
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 His Ser His Phe Ile Phe Tyr Ala Asp Leu Lys Gly Ser Pro Phe Glu
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 Tyr Glu Phe Asn Pro Ala Asp Ile Val Ala Glu Asp Ala Leu Gly Tyr
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 Val Gly Val Thr Lys Asp Ser Ile Leu Val Asp His Asp Gly His Leu
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Lys Leu Asp Leu Gly Ser Arg Lys Asp Pro Leu Gln Arg Lys Gly Leu
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Ser Leu Leu Pro Asn Leu Glu Thr Leu Gly Ile Gly Phe Thr Pro Ile
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Lys Asp Ile Ser Pro Val Leu Gln Phe Lys Lys Leu Lys Gln Leu Leu
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Met Thr Lys Thr Gly Val Thr Asp Tyr Arg Phe Leu Asp Asn Met Pro
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Asp Ile Ser His Asn Asn Ile Ser Leu Ala Asp Leu Lys Leu Asn Glu
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Asn His Asn His Thr Tyr Glu Asp Glu Glu Gly His Ala His Glu His
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<213> Streptococcus agalactiae

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Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
 65 70 75 80

Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
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Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
 100 105 110

Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr
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Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser
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370 375 380

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Lys Pro Tyr Asp Thr Ser Asp Ala Tyr Val Phe Ser Lys Glu Ser Ile
420 425 430

His Ser Val Asp Lys Ser Gly Val Thr Ala Lys His Gly Asp His Phe
 435 440 445

His Tyr Ile Gly Phe Gly Glu Leu Glu Gln Tyr Glu Leu Asp Glu Val
 450 455 460

Ala Asn Trp Val Lys Ala Lys Gly Gln Ala Asp Glu Leu Val Ala Ala
 465 470 475 480

Leu Asp Gln Glu Gln Gly Lys Glu Lys Pro Leu Phe Asp Thr Lys Lys
 485 490 495

Val Ser Arg Lys Val Thr Lys Asp Gly Lys Val Gly Tyr Ile Met Pro
 500 505 510

Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Tyr Gln Leu Asp Leu Thr
 515 520 525

Gln Ile Ala Phe Ala Glu Gln Glu Leu Met Leu Lys Asp Lys Lys His
 530 535 540

Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu Ala Val
 545 550 555 560

Asp Val Ser Ser Leu Pro Met His Ala Gly Asn Ala Thr Tyr Asp Thr
 565 570 575

Gly Ser Ser Phe Val Ile Pro His Ile Asp His Ile His Val Val Pro
 580 585 590

Tyr Ser Trp Leu Thr Arg Asn Gln Ile Ala Thr Ile Lys Tyr Val Met
 595 600 605

Gln His Pro Glu Val Arg Pro Asp Val Trp Ser Lys Pro Gly His Glu
 610 615 620

Glu Ser Gly Ser Val Ile Pro Asn Val Thr Pro Leu Asp Lys Arg Ala
 625 630 635 640

Gly Met Pro Asn Trp Gln Ile Ile His Ser Ala Glu Glu Val Gln Lys
 645 650 655

Ala Leu Ala Glu Gly Arg Phe Ala Ala Pro Asp Gly Tyr Ile Phe Asp
 660 665 670

Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser
 675 680 685

Phe Ser Ile Pro Arg Ala Asp Gly Ser Ser Leu Arg Thr Ile Asn Lys
690 695 700

Ser Asp Leu Ser Gln Ala Glu Trp Gln Gln Ala Gln Glu Leu Leu Ala
705 710 715 720

Lys Lys Asn Ala Gly Asp Ala Thr Asp Thr Asp Lys Pro Glu Glu Lys
725 730 735

Gln Gln Ala Asp Lys Ser Asn Glu Asn Gln Gln Pro Ser Glu Ala Ser
740 745 750

Lys Glu Glu Lys Glu Ser Asp Asp Phe Ile Asp Ser Leu Pro Asp Tyr
755 760 765

Gly Leu Asp Arg Ala Thr Leu Glu Asp His Ile Asn Gln Leu Ala Gln
770 775 780

Lys Ala Asn Ile Asp Pro Lys Tyr Leu Ile Phe Gln Pro Glu Gly Val
785 790 795 800

Gln Phe Tyr Asn Lys Asn Gly Glu Leu Val Thr Tyr Asp Ile Lys Thr
805 810 815

Leu Gln Gln Ile Asn Pro
820

<210> 7

<211> 816

<212> PRT

<213> Streptococcus pneumoniae

<400> 7

Met Lys Ile Asn Lys Lys Tyr Leu Val Gly Ser Ala Ala Ala Leu Ile
1 5 10 15

Leu Ser Val Cys Ser Tyr Glu Leu Gly Leu Tyr Gln Ala Arg Thr Val
20 25 30

Lys Glu Asn Asn Arg Val Ser Tyr Ile Asp Gly Lys Gln Ala Thr Gln
35 40 45

Lys Thr Glu Asn Leu Thr Pro Asp Glu Val Ser Lys Arg Glu Gly Ile
50 55 60

Asn Ala Glu Gln Ile Val Ile Lys Ile Thr Asp Gln Gly Tyr Val Thr

65	70	75	80
Ser His Gly Asp His Tyr His Tyr Tyr Asn Gly Lys Val Pro Tyr Asp			
85	90	95	
Ala Ile Ile Ser Glu Glu Leu Leu Met Lys Asp Pro Asn Tyr Lys Leu			
100	105	110	
Lys Asp Glu Asp Ile Val Asn Glu Val Lys Gly Gly Tyr Val Ile Lys			
115	120	125	
Val Asp Gly Lys Tyr Tyr Val Tyr Leu Lys Asp Ala Ala His Ala Asp			
130	135	140	
Asn Val Arg Thr Lys Glu Glu Ile Asn Arg Gln Lys Gln Glu His Ser			
145	150	155	160
Gln His Arg Glu Gly Gly Thr Pro Arg Asn Asp Gly Ala Val Ala Leu			
165	170	175	
Ala Arg Ser Gln Gly Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Asn			
180	185	190	
Ala Ser Asp Ile Ile Glu Asp Thr Gly Asp Ala Tyr Ile Val Pro His			
195	200	205	
Gly Asp His Tyr His Tyr Ile Pro Lys Asn Glu Leu Ser Ala Ser Glu			
210	215	220	
Leu Ala Ala Ala Glu Ala Phe Leu Ser Gly Arg Gly Asn Leu Ser Asn			
225	230	235	240
Ser Arg Thr Tyr Arg Arg Gln Asn Ser Asp Asn Thr Ser Arg Thr Asn			
245	250	255	
Trp Val Pro Ser Val Ser Asn Pro Gly Thr Thr Asn Thr Asn Thr Ser			
260	265	270	
Asn Asn Ser Asn Thr Asn Ser Gln Ala Ser Gln Ser Asn Asp Ile Asp			
275	280	285	
Ser Leu Leu Lys Gln Leu Tyr Lys Leu Pro Leu Ser Gln Arg His Val			
290	295	300	
Glu Ser Asp Gly Leu Val Phe Asp Pro Ala Gln Ile Thr Ser Arg Thr			
305	310	315	320
Ala Arg Gly Val Ala Val Pro His Gly Asp His Tyr His Phe Ile Pro			

325	330	335
Tyr Ser Gln Met Ser Glu Leu Glu Glu Arg Ile Ala Arg Ile Ile Pro		
340	345	350
Leu Arg Tyr Arg Ser Asn His Trp Val Pro Asp Ser Arg Pro Glu Gln		
355	360	365
Pro Ser Pro Gln Pro Thr Pro Glu Pro Ser Pro Gly Pro Gln Pro Ala		
370	375	380
Pro Asn Leu Lys Ile Asp Ser Asn Ser Ser Leu Val Ser Gln Leu Val		
385	390	395
Arg Lys Val Gly Glu Gly Tyr Val Phe Glu Glu Lys Gly Ile Ser Arg		
405	410	415
Tyr Val Phe Ala Lys Asp Leu Pro Ser Glu Thr Val Lys Asn Leu Glu		
420	425	430
Ser Lys Leu Ser Lys Gln Glu Ser Val Ser His Thr Leu Thr Ala Lys		
435	440	445
Lys Glu Asn Val Ala Pro Arg Asp Gln Glu Phe Tyr Asp Lys Ala Tyr		
450	455	460
Asn Leu Leu Thr Glu Ala His Lys Ala Leu Phe Glu Asn Lys Gly Arg		
465	470	475
Asn Ser Asp Phe Gln Ala Leu Asp Lys Leu Leu Glu Arg Leu Asn Asp		
485	490	495
Glu Ser Thr Asn Lys Glu Lys Leu Val Asp Asp Leu Leu Ala Phe Leu		
500	505	510
Ala Pro Ile Thr His Pro Glu Arg Leu Gly Lys Pro Asn Ser Gln Ile		
515	520	525
Glu Tyr Thr Glu Asp Glu Val Arg Ile Ala Gln Leu Ala Asp Lys Tyr		
530	535	540
Thr Thr Ser Asp Gly Tyr Ile Phe Asp Glu His Asp Ile Ile Ser Asp		
545	550	555
Glu Gly Asp Ala Tyr Val Thr Pro His Met Gly His Ser His Trp Ile		
565	570	575
Gly Lys Asp Ser Leu Ser Asp Lys Glu Lys Val Ala Ala Gln Ala Tyr		

580	585	590
Thr Lys Glu Lys Gly Ile Leu Pro Pro Ser Pro Asp Ala Asp Val Lys		
595	600	605
Ala Asn Pro Thr Gly Asp Ser Ala Ala Ala Ile Tyr Asn Arg Val Lys		
610	615	620
Gly Glu Lys Arg Ile Pro Leu Val Arg Leu Pro Tyr Met Val Glu His		
625	630	635 640
Thr Val Glu Val Lys Asn Gly Asn Leu Ile Ile Pro His Lys Asp His		
645	650	655
Tyr His Asn Ile Lys Phe Ala Trp Phe Asp Asp His Thr Tyr Lys Ala		
660	665	670
Pro Asn Gly Tyr Thr Leu Glu Asp Leu Phe Ala Thr Ile Lys Tyr Tyr		
675	680	685
Val Glu His Pro Asp Glu Arg Pro His Ser Asn Asp Gly Trp Gly Asn		
690	695	700
Ala Ser Glu His Val Leu Gly Lys Lys Asp His Ser Glu Asp Pro Asn		
705	710	715 720
Lys Asn Phe Lys Ala Asp Glu Glu Pro Val Glu Glu Thr Pro Ala Glu		
725	730	735
Pro Glu Val Pro Gln Val Glu Thr Glu Lys Val Glu Ala Gln Leu Lys		
740	745	750
Glu Ala Glu Val Leu Leu Ala Lys Val Thr Asp Ser Ser Leu Lys Ala		
755	760	765
Asn Ala Thr Glu Thr Leu Ala Gly Leu Arg Asn Asn Leu Thr Leu Gln		
770	775	780
Ile Met Asp Asn Asn Ser Ile Met Ala Glu Ala Glu Lys Leu Leu Ala		
785	790	795 800
Leu Leu Lys Gly Ser Asn Pro Ser Ser Val Ser Lys Glu Lys Ile Asn		
805	810	815